Photonic Magnetism Amplification by Reflection and Its Computing Application - Light-Light Interactions to Perform Arithmetic Within a Computer

16 September 2024
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Introduction

Although this author has already circumscribed photonic magnetism amplification for the purpose of precision optical measurement of individual photons via the amplification of the discrete magnetism of the detected photons and the attenuation of the magnetism of a control photon, the concept of amplifying the magnetic footprint of a photon and thus its ability to influence other photons has computing applications, sc. in optical computing.

Abstract

That we might augment the photonic memristor concept of 8 March 2024, a mechanism which supports the modification of the frequency of light at specialized junctions is proposed. The photonic memristor and this novel mechanism for precision light-light frequency manipulation aided by precision nano-reflective chambers would complement one another in a future computing system. While the memristor is useful for storing a large possible number of values well-beyond zero and one (a form of 'quantum computer' as we currently define the term,) a mechanism capable of enabling individual values to be added or multiplied within the context of a single processing cycle without the need to start a new cycle would greatly enhance the efficiency of such a processor.

In an optical computer, values may be represented by the frequency of the light emitted within optical pathways. Light of multiple frequencies; perhaps with only subtle differences in frequency; could be used to represent disparate values and the light itself could be used to modify the frequency of other light with a high degree of precision, enabling two numbers to be added or multiplied at crystalline junctions which encourage the repeated reflection of photons between two parallel mirrors at extreme proximity to one another. The closer the mirrors are to one another, the closer are the photons of the two waveforms and the more opportunities the light has to interact with itself, particularly in its moment-amplified state at the instant of reflection.

If two waves of light are directed toward a common such junction whereas one waveform is made to arrive 25 attoseconds ahead ahead of the other, the first to arrive will, as a consequence of pushing back against the trailing wave, have the effect of stepping up the frequency of the other wave whilst experiencing a down-stepping of its own frequency. Eventually, both waveforms escape from the mechanism and proceed to their next destination due to a slight forward tilt in the mirror-pair. Note: The first mirror is a two-way mirror so that light may enter in the first place but may not exit except by exceeding the parameters of

the mirror after many reflections. In any such interaction, one of the waveforms becomes useless computationally but the other may proceed to be further modified by other values which one might wish to apply to the waveform.

Conclusion

For this approach to performing arithmetical functions to succeed, extreme precision timing will be required, enabled both by those mechanisms promulgated by this author concerning precision timing as well as the novel LED emitter proposed by this author which is capable of generating light with extremely low latency relative to the time of electrification and with extreme efficiency capable of controlling the quanta of light permitted to be introduced to an optical processor. In order to meet the responsivity requirement, the LED mechanism would need to emit light not only in response to electrification but in response to illumination by light stored in the memristors which may be released by Coulomb Force trigger as described in 8 March 2024. Although the Coulomb Force Lines are electrically-triggered, the lines exert force instantaneously over distance and in this way, electricity can be used to usefully prompt light emission in such a scheme within the time constraints posed.

It would be necessary to know the time of arrival of a photon in advance of any particular memristor to within a margin of error of about 5 attoseconds, meaning that the spacing and the angular tilt of the mirror pairs composing the junctions would need to be carefully controlled and understood in terms of the impact of spacing and tilt on photon arrival time at subsequent junctions. It would also be necessary to couple the memristors with their own LED nano-emitters which double as light-meters designed to emit light of a specific frequency and timing designed to arrive at a subsequent distortion junction just ahead of the arithmetical photon(s.) These LED emitters would emit light of a fixed amplitude regardless of the amplitude regardless of the amplitude or frequency of the light used to stimulate the emitter. However, the greater the amplitude of light used to stimulate the emitter, the greater would be the frequency of the emitted light in such an emitter.

With all of these ingredients, it should be possible to use light to transmogrify other light in-flight in order to sum the amplitude values of light in many photonic memristor nodes within the context of a single optical processor cycle.